SA MAR-ECO: PATTERNS AND PROCESSES OF THE ECOSYSTEMS OF THE SOUTHERN MID-ATLANTIC

Background:

The South Atlantic MAR-ECO (SA MAR-ECO) initiative started in 2006 as a spin-off project of "*MAR-ECO: Patterns and Processes of the Ecosystems of the Northern Mid-Atlantic*. SA MAR-ECO was conceived to expand the MAR-ECO project into the South Atlantic being also supported by other CoML field projects, primarily CenSeam (*A Global Census of Marine Life on Seamounts*) and others.

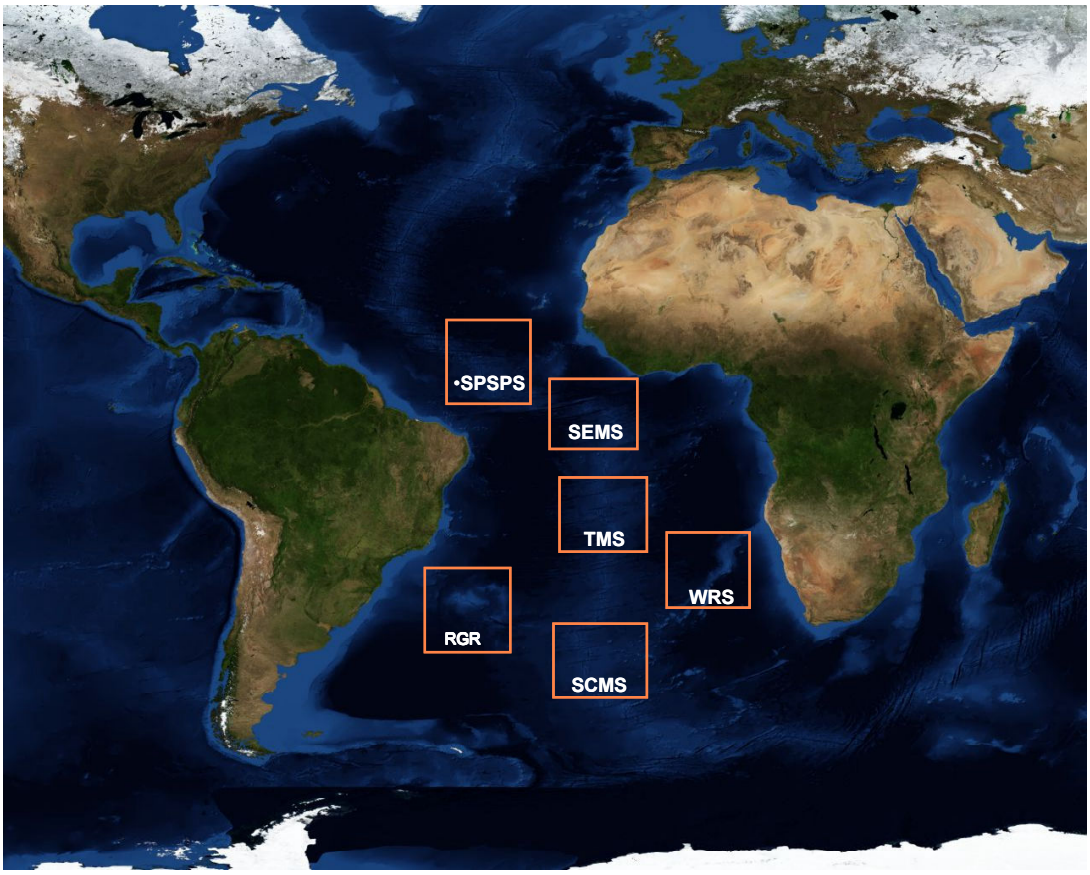
Goals:

The overriding goals have been defined as:

- Describing and understanding the patterns of distribution, abundance and trophic relationships of the organisms inhabiting the mid-oceanic South Atlantic ridge and adjacent areas;
- Exploring the role of mid-oceanic South Atlantic ridge and its adjacent morphological features in deep-water fauna dispersal processes between the coasts of Africa and South America and among the north Atlantic, Pacific, Indian and Antarctic oceans.

Target areas:

The study will primarily focus on the south mid-oceanic ridge itself but also cover adjacent morphological features in six target areas (Figure 1) within which sampling activities have been planned independently by regional teams of committed scientists under the coordination of the SA MAR-ECO Steering Group.



http://earthobservatory.nasa.gov/newsroom/bluemarble

Figure 1. Target Areas of South Atlantic MAR-ECO. *SPSPS*: St. Peter and St. Paul Rocks sector; *SEMS:* South Equatorial MAR sector; *TMS:* Tropical MAR sector; *RGR:* Rio Grande rise sector; *WRS:* Walvis Ridge sector; *SCMS:* Subtropical Confluence MAR sector.

Organization:

The SA MAR-ECO has been coordinated from South America, and led by a South Atlantic MAR-ECO Steering Group (Table 1). This group includes one member from the North Atlantic MAR-ECO Steering Group and the chair of the South Atlantic SG also meet in the North Atlantic SG.

A total of 33 scientists from Brazil, Uruguay, Argentina, Chile, South Africa, Namibia, Germany and Norway are currently engaged at SA MAR-ECO (Table 2). These scientists take part in working groups assigned by the SG to develop and conduct proposals in the themes: zooplankton, macrobenthos, pelagic nekton, demersal nekton and microbiology. There are also two supporting working groups dedicated at data mining and environmental setting (geology and oceanography). Table 3 lists the leaders of each working group.

Table 1. South Atlantic MAR-ECO Steering Group

Participants	Country
José Angel Alvarez Perez – Chair	Brazil
Débora Pires	Brazil
Pablo Muniz Maciel	Uruguay
Ricardo Serrão Santos	Portugal
Malcolm Clark	New Zealand
Viviana Alder	Argentina
Johan Augustin	South Africa
Hashaly Hamukuaya	Namibia

Table 2. Participants of South Atlantic MAR-ECO. *ES:* Environmental setting; *DM:* Data mining; *Mic:* Microbiology; *Zp:* Zooplankton; *DN:* Demersal nekton; *PN:* Pelagic nekton; *Mac:* Macrobenthos.

Scientist	University	Country	Working Group							Adress
			ES	DM	Mic	Zp	DN	PN	Mac	
José Angel A. Perez	University of Vale do Itajaí Fishery Studies Group	Brazil		X			X	X		angel.perez@univali.br
Eliana S. Alves	University of Vale do Itajaí Laboratory of Biological Oceanography	Brazil		X						lialves@lycos.com
José Gustavo Natorf	University of Vale do Itajaí Laboratory of Geological Oceanography	Brazil	X							gabreu@univali.br
José H. Muelbert	Federal University of Rio Grande Department of Oceanography	Brazil	X							jhm@furg.br
Leonardo Rubi Rorig	University of Vale do Itajaí Laboratory of Applied Microbiology	Brazil			X					rorig@univali.br
André O. S. Lima	University of Vale do Itajaí Laboratory of Applied Microbiology	Brazil			X					lima@univali.br
Marcus Adonai C. Silva	University of Vale do Itajaí Laboratory of Applied Microbiology	Brazil			X					marcus.silva@univali.br
Paulo Ricardo Schwingel	University of Vale do Itajaí Fishery Studies Group	Brazil						X		schwingel@univali.br
Michael M. Mincarone	University of Vale do Itajaí Oceanographic Museum	Brazil					X	X		mincarone@univali.br
Jorge Pablo Castello	Federal University of Rio Grande Department of Oceanography	Brazil						X		docjpc@furg.br
Mônica M. C. Muelbert	Federal University of Rio Grande Department of Oceanography	Brazil						X		monica.muelbert@furg.br
Paulo Travassos	Federal and Rural University of Pernambuco/ Department of Fishery and Aquaculture	Brazil						X		paulotr@ufrpe.br

Scientist	University	Country	Working Group							Adress
			ES	DM	Mic	Zp	DN	PN	Mac	
Fábio H. V. Hazin	Federal and Rural University of Pernambuco/ Department of Fishery and Aquaculture	Brazil						X		fhvhazin@terra.com.br
Uwe Piatkowski	University of Kiel Research Division of Marine Ecology	Germany					X	X		upiatkowski@ifm.uni-kiel.de
Agnaldo S. Martins	Federal University of Espírito Santo Department of Ecology and Natural Resources	Brazil					X	X		agnaldo@pq.cnpq.br
Manuel Haimovici	Federal University of Rio Grande Department of Oceanography	Brazil					X	X		docmhm@furg.br
Tatiana Silva Leite	Federal University of Rio Grande do Norte/ Laboratory of Fishery Biology	Brazil					X	X		leite_ts@yahoo.com.br
Érica A. G. Vidal	Federal University of Paraná Studies of the Sea Centre	Brazil					X	X		ericavidal2000@yahoo.com.br
Roberta A. dos Santos	IBAMA/CEPSUL	Brazil					X	X		roberta.santos@ibama.gov
Paulo Alberto S. Costa	Federal University of Rio de Janeiro/ Laboratory of Population Dynamics	Brazil					X	X		pauloascosta@uol.com.br
Rodrigo S. Martins	University of Cape Town Marine and Coastal Management	South Africa					X	X		rodrigo.plei@gmail.com
Luis F. L. Fernandes	Federal University of Espírito Santo/ Department of Ecology and Natural Resources	Brazil				X				luiz.ufes@gmail.com
Viviana Andréa Alder	University of Buenos Aires Department EGE	Argentina				X				viviana_alder@yahoo.com
Tone Falkenhaug	Institute of Marine Research	Norway				X				Tone.Falkenhaug@imr.no
Débora de Oliveira Pires	Federal University of Rio de Janeiro Nacional Museum	Brazil							X	debora.pires@coralvivo.org.br
Eduardo Hajdu	Federal University of Rio de Janeiro Nacional Museum	Brazil							X	hajdu@acd.ufrj.br

Scientist	University	Country	Working Group							Adress
			ES	DM	Mic	Zp	DN	PN	Mac	
Helena Passeri Lavrado	Federal University of Rio de Janeiro Nacional Museum	Brazil							X	hpasseri@biologia.ufrj
Carlos R. R. Ventura	Federal University of Rio de Janeiro Nacional Museum	Brazil							X	ventura@acd.ufrj.br
Clovis B. Castro	Federal University of Rio de Janeiro Nacional Museum	Brazil							X	clovis.castro@coralvivo.org.br
Pablo Muniz Maciel	University of the Republic College of Sciences	Uruguay							X	pmmaciel@fcien.edu.uy
Abílio Soares Gomes	University Federal Fluminense Department of Marine Biology	Brazil							X	abilio@vm.uff.br
Javier Sellanes	College of Sciences of the Sea	Chile							X	sellanes@ucn.cl
Rodolfo Elías	National University of Mar del Plata Department of Marine Sciences	Argentina							X	roelias@mdp.edu.ar

Table 3. Leaders of the working groups of South Atlantic MAR-ECO. *SPSP:* St. Peter and St. Paul rocks; *RGR:* Rio Grande Rise.

Working Group	Leader	Adress
Environmental setting	José H. Muelbert	jhm@furg.br
Data mining	José A. A. Perez	angel.perez@univali.br
Microbiology	Leonardo R. Rorig	rorig@univali.br
Zooplankton	Luis F. L. Fernandes	luiz.ufes@gmail.com
Pelagic Nekton	Mônica M. C. Muelbert	monica.muelbert@furg.br
Demersal Nekton	Tatiana Silva Leite	leite_ts@yahoo.com.br
Macrobenthos	Abílio Soares Gomes	abilio@vm.uff.br
Sector – SPSP	Fábio H. V. Hazin	fhvhazin@terra.com.br
Sector – RGR	Abílio Soares Gomes	abilio@vm.uff.br

Strategy

The development of the SA MAR-ECO project will include nine phases as listed bellow. The past two years have been dedicated to planning activities and concentrated in the first five phases:

1. **Workshops and SG meetings** promoted in order to define objectives, specific goals, sampling strategies, partnerships and funding possibilities, etc.
2. **Allocation of responsibilities and project building:** commitment of partners to specific tasks and responsibilities.
3. **Literature studies and data mining:** assembly of current and archived information on biodiversity, oceanography and geology of the Mid-oceanic South Atlantic as a part of the planning process and as a source of comparative information.
4. **Modelling:** development of central models and testable hypotheses relevant to the study of patterns and processes of the mid-oceanic environment.
5. **Technological adaptation and fitting of research vessels:** adaptation of new technology developed and tested by North Atlantic MAR-ECO in order to produce comparative results in the mid-oceanic South Atlantic. This phase will parallel discussions about sampling strategies and availability of research vessels. Also, mobilization of shiptime and gears will be a major issue in the phase.

6. **Field study:** a major field effort, focusing the target areas (Figure 1) will be conducted to provide the material and data for subsequent analyses, possibly involving several well-equipped research vessels.
7. **Analysis:** the material collected in phase 6 will be worked up in individual laboratories under the coordination of the SA Steering Group.
8. **Regional synthesis:** the central questions and hypotheses formulated for the MAR-ECO approach in the South Atlantic will be addressed in the light of results obtained by activities conducted during phases 6 and 7, and a final symposium should be organised where results are presented and discussed.
9. **Incorporation of results in global census models:** it will be to compare and unify patterns emerged from MAR-ECO approach both in North and South Atlantic, and will also provide important data on South Atlantic seamounts to feed into CenSeam and CoML.

Funding:

A preliminary science plan elaborated by the South Atlantic Steering Group was included in the MAR-ECO renewal proposal being approved by the A. P. Sloan Foundation for the period 1 July 2007 - 31 June 2009. Brazil has taken the responsibility of coordinating the SA MAR-ECO Steering Group (SG) and the process of project development through an agreement between IMR (Institute of Marine Research, Norway), VIMS (Virginia Institute of Marine Science, USA) and UNIVALI (University of "Vale do Itajaí", Brazil).

Searching for potential shiptime providers and funding possibilities have been critical to the development of field activities. Opportunities currently explored include:

- "Arquipélago Project" – CIRM/ Brazilian Navy
- SEAFO (Southeast Atlantic Fisheries Organization)
- FAO – Nansen Project (proposed by South Africa, Namibia and Angola)
- NERC (UK) consortium – ECOMAR
- Atlantic Meridional Transect (AMT) project

and other existing sampling programs both within and outside the umbrella of the Census of Marine Life.